

# **Apparatus and method for obtaining intact fresh grains from fresh grainy fruits, in particular pomegranate**

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## **Field and Background of Invention:**

Todate the known methods for disassembling fresh grainy fruits are the following:

- \* By cutting open the fresh fruit and using thin air pressure or water jets.
- \* By cutting open the fresh fruit and mechanically beating the outer shell.
- \* By cutting open the fresh fruit and mechanically shaking the fruit.
- \* Opening the fresh fruit by hand and disassembling the grains manually.

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The disadvantage of all the above methods is, the damaging of the fresh grains when the fresh fruit is cut open, it needs expensive manpower and it is not useful for mass production.

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The method introduced hereinafter is a low-cost method suitable both, for mass production and for domestic use.

## **Summary of the Invention**

The method is based on sending vibrations in the appropriate resonance frequency 20 into a container full of conductive liquid in which the fresh grainy fruits are placed. Once the grains are affected by the resonance they detach from the fruit and leave the liquid separated.

The method is put into function by using an apparatus consisting of the following parts: an engine (1) placed on a surface-bridge (6) located on top of liquid container 25 (8), a pitman (3) which on one side is connected to engine (1) and on the other side to arm (7) which is connected to paddle (10) that is submerged in the liquid (9).

Engine (1) provides vibrations in a desired resonance frequency. The resonance, which is controlled by height of wave resulting from ex-center's (2) deviation from center of axis (1a) and length of wave resulting from engine's rotation speed, is 30 transferred to liquid container via pitman (3). Pitman (3) changes the rotary motion

through arm (7) into reciprocating movement of paddle (10) that creates the appropriate waves in the liquid (9).

The deviation of ex-center from center of axis (1a) and the length of wave resulting from engine's rotation speed affects the desired resonance frequency. When the fresh fruit receives the vibrations in the appropriate resonance frequency the fruit is 5 disassembled, the heavy grains sink and are been directed to a collecting tank, whereas the floating skin is removed to separate container.

### **Short Description of Drawing**

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Fig. 1 shows a block diagram of an apparatus, which gives a general idea of the method. The apparatus is composed of the following parts: engine (1), ex-center (2), axis(1a), pitman (3), bearings (4) & (5), a surface-bridge (6), arm (7), container (8), conductive liquid (9) and paddle(10).

Engine (1) is placed on surface-bridge (6) that is located on top of liquid container (8). 15 The pitman (3) is secured by bearing (4) to arm (7) on one side and to axis (1a) of engine (1) on the other side. Arm (7) is secured to pitman by bearing (4) and to surface-bridge (6) by bearing (5) and at its lower part it is connected to paddle (10), which is submerged in container (8) containing conductive liquid (9).

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### **Detailed Description of the Invention**

The invention introduced hereunder includes an apparatus for easy and low-cost disassembling of fresh grainy fruits, (incl. vegetable) in particular pomegranate, without harming the fresh grains. The apparatus consists of the following parts: a sliding ramp, an engine (1) placed on a surface-bridge (6) covering a liquid container 25 (8), a pitman (3) which on one side is connected to engine (1) and on the other side to arm (7) and a paddle(10), which is submerged in conductive liquid(9) placed in container (8). Engine (1) of min. capacity 2HP provides vibrations in a desired resonance frequency, which is controlled by height of wave resulting from ex-center's(2) deviation from center of axis (1a) and length of wave resulting from 30

engine's rotation speed. The desired resonance frequency is transferred to conductive liquid in container (8) via pitman (3). Pitman (3) changes the rotary motion of paddle (10) through arm (7) into reciprocating movement of paddle(10).

The deviation of ex-center from center of axis (1a) and the length of wave resulting from engine's rotation speed affects the desired resonance frequency. When the 5 appropriate resonance frequency reaches the conductive liquid it affects the fresh fruit in the liquid and causes it to disassemble. The unharmed heavy grains sink and are collected and directed to a collecting tank whereas the floating skin is disposed of through a separate container.

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